

## REMARKS

Applicant intends this response to be a complete response to the Examiner's 12 August 2003 Non-Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

### *Claim Rejections - 35 U.S.C. § 112*

**Claims 35-36, 38-42, 44-50 and 60-68** stand rejected under 25 U.S.C. § 112, first paragraph, because the specification, while being enabling for a method of controlling fire ants using a composition comprising an effective amount of the demonstrated strain of *Rhodobacter capsulatus* in a viable (*i.e.*, not dead) state, does not reasonably provide enablement for "controlling any and all insect populations using a composition comprising any and all species and subspecies of *Rhodobacter* (dead or alive) as instantly claimed (nor for using an extract thereof or a composition which includes at least one endotoxin produced thereby). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected to make and/or use the invention commensurate in scope with these claims.

While Applicants still disagree with the Examiner's attempt to limit the scope of the application to a particular species of *Rhodobacter*, Applicants have amended the claims to *Rhodobacter capsulatus*. Applicants are somewhat surprised by the Examiner's attempt now to narrow the application to a single strain of *Rhodobacter capsulatus*. *Rhodobacter capsulatus* is one of the most studied bacteria because it fixes nitrogen. All *Rhodobacter capsulatus* fix nitrogen; all have similar genetic make up and most of the phenotypes are genetic modification of *Rhodobacter capsulatus* or other *Rhodobacter*.

Even though, the Applicants have demonstrated that five different gram negative bacteria are active in killing fire ants and other insects. In stead of looking at this data as good evidence that the entire class of gram negative bacteria have insecticidal properties, the Examiner is looking for an exhaustive study of all gram negative bacteria. The patent statutes do not require such exhaustive studies. Applicant now show evidence that a strain of *Rhodobacter capsulatus* has this same insecticidal property and the Examiner wants data on all *Rhodobacter capsulatus* to grant protect to the species. Yet all natural strains of *Rhodobacter capsulatus*, a widely studied bacteria, are photosynthetic, fix nitrogen and have similar overall characteristics. Thus, one of ordinary skill in the art would fully expect that if one natural strain of *Rhodobacter capsulatus* has insecticidal properties so well all strains of *Rhodobacter capsulatus*, especially, when the Applicants simply

selected a *Rhodobacter capsulatus* strain at random.

Because *Rhodobacter capsulatus* is a very well studied species of photosynthetic and nitrogen fixing bacteria, the *Rhodobacter capsulatus* strains are all photosynthetic and nitrogen fixing bacteria and an ordinary artisan would fully expect that upon showing that one strain of *Rhodobacter capsulatus* possessed insecticidal activity, all *Rhodobacter capsulatus* would be insecticides, Applicants request withdrawal of this rejection.

As to the issue of availability, Applicants *Rhodobacter capsulatus* species is available from BioStim, LLC, licensee of the technology. Thus, the public can obtain the claimed invention directly from BioStim, LLC. Applicants will also submit a viable culture to a depository if allowable subject material matures from this application. Applicants, therefore, respectfully request withdrawal of this rejection. Upon receipt of a Notice of Allowance, Applicants will make a deposit of the bacteria to a depository.

#### *Claim Rejections - 35 U.S.C. § 102*

**Claims 35, 38-42, 44-50 and 60-68** stand rejected under 35 U.S.C. § 102(b) as being anticipated by Jong et al (KR 9411524 - DWPI Abstract), with evidence provided by the ATCC Catalogue of Bacteria and Bacteriophages (18th ed., 1992).

The Examiner contends as follows:

Jong et al teach a composition comprising *Rhodopseudomonas capsulatus* (which, as evidenced by the ATCC Catalogue, is now well known and recognized in the art as *Rhodobacter* i.e., *Rhodobacter capsulatus* was earlier known as *Rhodopseudomonas capsulatus*, however, *Rhodopseudomonas capsulatus* has been renamed *Rhodobacter capsulatus* - see, e.g., page 269 and 275 under the respective genus/species headings *Rhodobacter capsulatus* and *Rhodopseudomonas capsulatus*) as an active ingredient therein, whereby the composition further includes carbohydrate and/or humus (please note that humus is dead plant material and, thus, would inherently contain cellulosic material therein since cellulosic material such as cellulose is "amorphous carbohydrate polymer ( $C_6H_{10}O_5$ ), the main constituent of all plant tissues and fibers" (Webster's Dictionary, 1988) -- see DWPI Abstract. Based upon the unclarity of claims 33-34 (including the lack of antecedent basis limitations discussed above), the composition taught by Jong et al. reads upon these claims, as drafted. Please note that nothing would preclude the additional ingredient(s) disclosed by the cited reference from being used as "insect food."

Therefore, the reference is deemed to anticipate the instant claims above.

Applicants disagrees that Jong et al anticipate the present invention or renders the present invention obvious. Jong et al discloses a feed for livestock to reduce excrement order. The Jong et al composition includes 1-8 wt.% of the microbe and below 1 wt.% of lower carbohydrate as

culture agent.

The present invention is a composition and a bait for controlling insect populations. The composition includes sufficient bacteria (dead or alive) to render the composition deadly to insects. The composition includes from about  $5 \times 10^9$  to about  $1 \times 10^{13}$  bacteria per gram and a food stuff that comprises a majority of the composition, at least 50 wt.% in the case of carbohydrates for fire ants. Thus, the compositions must contain a sufficient amount of insect food for the insects to recognize that the composition is a food. The Jong et al composition includes less than 1 wt.% of carbohydrates from the culture material. The present invention clearly includes more than the amount of carbohydrate from the culture medium as is evidenced in the specification, where the food stuff may also include culture residue (see paragraph [0045]).

Moreover, Jong et al. does not disclose that the composition controls insect populations. In fact, none of the cited reference even suggest that *Rhodobacter capsulatus* can control insect populations when mixed with an insect food stuff.

Because Jong et al does not disclose a composition for controlling insect populations including an insect food and an insecticidal amount of *Rhodobacter capsulatus* bacteria (viable or non-viable), where ingestion results in insect death, Jong et al does not anticipate nor render obvious the present invention of new claims 35-59. Applicants, therefore, respectfully request withdrawal of this section 102(b) rejection.

**Claims 35, 38-42, 44-50 and 60-68** stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kobayashi (JP 05247378 - CAPLUS Abstract), with evidence provided by the ATCC Catalogue of Bacteria and Bacteriophages (18th ed. 1992).

The Examiner contends as follows:

Kobayashi teaches a composition comprising *Rhodopseudomonas capsulatus* (which, as evidenced by the ATCC Catalogue, is now well known and recognized in the art as *Rhodobacter capsulatus* - i.e., *Rhodobacter capsulatus* was earlier known as *Rhodopseudomonas capsulatus*; however, *Rhodopseudomonas capsulatus* has since been renamed *Rhodobacter capsulatus* - see, e.g., page 269 and 275 under the respective genus/species headings *Rhodobacter capsulatus* and *Rhodopseudomonas capsulatus*) as an active ingredient therein, whereby the composition further includes cellulose (a carbohydrate polymer) - see CAPLUS Abstract. Based upon the unclarity of claims 33-34 (including the lack of antecedent basis limitations discussed above), the composition, taught by Kobayashi reads upon these claims, as drafted. Please note that nothing would preclude the additional ingredient(s) disclosed by the cited reference from being used as "insect food."

Therefore, the reference is deemed to anticipate the instant claims above.

Applicants disagrees that Kobayashi discloses the cited claims. Kobayashi discloses coating for improving water quality. Kobayashi is a water treatment composition. The carbohydrates in Kobayashi are derived from the culture medium; they are not a separate component of the composition as is true for the present compositions. Kobayashi is not an insecticide composition, but a water treatment composition. Kobayashi does not disclose a composition for controlling insect populations that includes a separate insect food and an insecticidal effective amount of *Rhodobacter capsulatus* bacteria (viable or non-viable), nor the use of such a composition to control insect populations. The Kobayashi is designed to improve water quality. Kobayashi does not disclose the present composition, nor the use of the present composition in controlling insect populations.

Because Kobayashi does not disclose a composition including an insect food and an insecticidal amount of *Rhodobacter capsulatus* bacteria (viable or non-viable), or disclose the use of such composition in controlling insect populations, Kobayashi does not anticipate nor render obvious the present invention of new claims 35-59. Applicants, therefore, respectfully request withdrawal of this section 102(b) rejection.

**Claims 35, 38-42, 44-50 and 60-68** stand rejected under 35 U.S.C. 102(b) as being anticipated by Nippon Life KK (JP 60027672 - DWPI Abstract), with evidence provided by the ATCC Catalogue Bacteria and Bacteriophages (18th ed., 1992).

The Examiner contends as follows:

Nippon Life KK teaches a composition comprising *Rhodopseudomonas capsulatus* (which, as evidenced by the ATCC Catalogue, is now well known and recognized in the art as *Rhodobacter capsulatus* -i.e., *Rhodobacter capsulatus* was earlier known as *Rhodopseudomonas capsulatus*, however, *Rhodopseudomonas capsulatus* has since been renamed *Rhodobacter capsulatus* - see, e.g., pages 269 and 275 under the respective genus/species headings *Rhodobacter capsulatus* and *Rhodopseudomonas capsulatus*) as an active ingredient therein, whereby the composition further includes various carbohydrate-containing ingredients including rice bran which would inherently comprise cellulosic material (e.g., cellulose - a carbohydrate polymer) - see DWPI Abstract. Based upon the unclarity of claims 33-34 (including the lack of antecedent basis limitations discussed above), the composition taught by Nippon Life KK reads upon these claims, as drafted. Please note that nothing would preclude the additional ingredient(s) disclosed by the cited reference from being used as "insect food."

Therefore, the reference is deemed to anticipate the instant claims above.

Nippon Life KK discloses **an aqueous fertilizer** including food for the bacteria, which again is derived from the culture media. The present invention is not a fertilizer and includes an insect food that may include culture medium residue, but clearly the residue is not the major ingredient of

the insect food. Nippon Life KK does not disclose the compositions of this invention and do not disclose the use of these compositions for controlling insect populations.

Because Nippon Life KK does not disclose a composition including an insect food, separate from the culture medium, and an **insecticidal** amount of *Rhodobacter capsulatus* bacteria (viable or non-viable), or the use of the compositions to control insect populations upon ingestion, Nippon Life KK does not anticipate nor render obvious the present invention. Applicants, therefore, respectfully request withdrawal of this section 102(b) rejection.

**Claims 35-36, 38-42, 44-50 and 60-68** stand rejected under 35 U.S.C. § 102(b) as being anticipated Matsuda (JP 05304959 - JPAB Abstract), with evidence provided by the ATCC Catalogue of Bacteria and Bacteriophages (18th ed 992).

The Examiner contends as follows:

Matsuda teaches a composition comprising *Rhodopseudomonas capsulatus* (which, as evidenced by the ATCC Catalogue, is now well known and recognized in the art as *Rhodobacter capsulatus* - i.e., *Rhodobacter capsulatus* was earlier known as *Rhodopseudomonas capsulatus*, however, *Rhodopseudomonas capsulatus* has since been renamed *Rhodobacter capsulatus* - see, e.g., pages 269 and 275 under the respective genus/species headings *Rhodobacter capsulatus* and *Rhodopseudomonas capsulatus*) in an amount of  $10^6$ - $10^{10}$ /g (which although very difficult to interpret due to the U.S.C. 112, second paragraph rejections above including those concerning lack of antecedent basis, appear to be within the approximately claimed amount range) as an active ingredient therein, whereby the composition further comprises a bacterial culture solution (which would inherently contain at least one carbohydrate therein) - see JPAB Abstract. Please note that nothing would preclude the additional ingredient(s) disclosed by the cited reference from being used as "insect food."

Therefore, the reference is deemed to anticipate the instant claims above.

Matsuda does not relate to a composition including an insect food and an insecticidal effective amount of *Rhodobacter capsulatus* bacteria (viable or non-viable). Matsuda, like Kobayashi, discloses an aqueous material contained in a bead for use in water treatment. Again, the composition only contains incidental amounts of carbohydrate and those are present for the bacteria to eat. The present compositions include an insect food that may include the culture residue, but is a separately added insect food stuff. Matsuda does not disclose such compositions or the use of such compositions to control insect populations.

Because Matsuda does not disclose a composition including an insect food and an insecticidal amount of *Rhodobacter capsulatus* bacteria (viable or non-viable), where ingestion results in insect death, Matsuda does not anticipate nor render obvious the present invention.

Applicants, therefore, respectfully request withdrawal of this section 102(b) rejection.

**Claims 35, 38-42, 44-50 and 60-68** stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kobayashi et al (JP 09238681 - JPAB Abstract), with evidence provided by the ATCC Catalogue of Bacteria and Bacteriophages (18th ed. 1992).

The Examiner contends as follows:

Kobayashi et al. teach a composition comprising *Rhodopseudomonas capsulatus* (which, as evidenced by the ATCC Catalogue, is now well known and recognized in the art as *Rhodobacter capsulatus* - i.e., *Rhodobacter capsulatus* was earlier known as *Rhodopseudomonas capsulatus*; however, *Rhodopseudomonas capsulatus* has since been renamed *Rhodobacter capsulatus* - see, e.g., pages 269 and 275 under the respective genus/species headings *Rhodobacter capsulatus* and *Rhodopseudomonas capsulatus*) as an active ingredient therein, whereby the composition further a seaweed polysaccharide (carbohydrate) - see JPAB Abstract. Based upon the unclarity of claims 33-34 (including the lack of antecedent basis limitations discussed above), the composition taught by Kobayashi et al. reads upon these claims, as drafted. Please note that nothing would preclude the additional ingredient(s) disclosed by the cited reference from being used as "insect food."

Therefore, the reference is deemed to anticipate the instant claims above.

Kobayashi et al also again relates to compositions for water quality. The material is not lethal to its environment and does not result in the death of animals within the environment in which it is intended. Moreover, the carbohydrates used in the composition are either to form the material into a gel or are nutrients for the bacteria. Kobayashi et al does not disclose a composition including an insect food that may include culture residue and an **insecticidal effective amount** of *Rhodobacter capsulatus* bacteria (viable or non-viable) or that the compositions can be used to control insect populations.

Because Kobayashi et al do not disclose a composition including an insect food and an insecticidal amount of *Rhodobacter capsulatus* bacteria (viable or non-viable), where ingestion results in insect death, Kobayashi et al do not anticipate nor render obvious the present invention of new claims 35-59. Applicants, therefore, respectfully request withdrawal of this section 102(b) rejection.

**Claims 35-36, 38-42, 44-50 and 60-68** under 35 U.S.C. § 102(b) as being anticipated by the ATCC Catalogue of Bacteria and Bacteriophages (18<sup>th</sup> ed. 1992).

The Examiner contends as follows:

The ATCC Catalogue teaches compositions comprising pure cultures (thus, apparently within the claimed amount ranges) of *Rhodopseudomonas capsulatus* (which, as evidenced by the ATCC Catalogue, is now well known and recognized

in the art as *Rhodobacter capsulatus*. *Rhodobacter capsulatus* was earlier known as *Rhodopseudomonas capsulatus*; however, *Rhodopseudomonas capsulatus* has since been renamed *Rhodobacter capsulatus* - see, e.g., pages 269 and 275 under the respective genus/species headings *Rhodobacter capsulatus* and *Rhodopseudomonas capsulatus*), whereby the composition further comprises a concentrated growth medium (which would inherently contain at least one carbohydrate therein) as well as double strength skim milk (which also inherently contains such as lactose)- see, e.g., pages vi, 269, 275, 542 and 543. Please note that nothing would preclude the additional ingredient(s) disclosed by used as "insect food".

Therefore, the reference is deemed to anticipate the instant claims above.

The ATCC Catalogue of Bacteria and Bacteriophages relates to culture media for growing the bacteria, not to compositions of killing insects. The Examiner appears fixated on the culture medium containing carbohydrates. It clearly does, but the present invention includes an insect food that is more than the culture residue in which the bacteria were raised. The compositions of this invention includes a separate food stuff that may include the culture residue, but is clearly more than the culture residue. In fact, the food stuff comprises a major portion of the compositions, while the composition only includes from about  $5 \times 10^9$  to about  $1 \times 10^{13}$  bacteria per gram.

Because ATCC Catalogue of Bacteria and Bacteriophages does not disclose a composition including an insect food and an insecticidal amount of *Rhodobacter capsulatus* bacteria (viable or non-viable) or the use of such compositions to control insect populations, ATCC Catalogue of Bacteria and Bacteriophages does not anticipate nor render obvious the present invention of new claims 35-59. Applicants, therefore, respectfully request withdrawal of this section 102(b) rejection.

#### *Rejections 35 U.S.C. § 103*

**Claims 35-36, 38-42, 44-50 and 60-68** stand rejections 35 U.S.C. § 103 (a) as being unpatentable over Jong et al. (KR 9411524 - DWPI Abstract), Kobayashi (JP 05247378-CAPLUS Abstract), Nippon Life KK (JP 60027672 - DWPI Abstract), Matsuda (JP -05304959 - JPAB Abstract), or Kobayashi et al. (JP 09238681 - JPAB Abstract), with evidence provided by the ATCC Catalogue of Bacteria and Bacteriophages (18<sup>th</sup> ed., 1992), or over the ATCC Catalogue of Bacteria and Bacteriophages (18<sup>th</sup> ed., 1992).

Applicants reassert all the points set forth above. None of the cited references, alone or in any combination, disclose, teach or suggest a composition including an insect food (major portion) and an insecticidal effective amount of *Rhodobacter capsulatus* bacteria (viable or non-viable), where ingestion results in insect death. None of the reference even speak to insects or insecticides. They are silent on the very aspect of this invention.

New claims 60 to 68 are specifically directed to fire ant control compositions. Applicants believe that these new claims are patentable over the cited art, which does not disclose or disclose, teach or suggest compositions to control fire ants.

Because none of the cited references alone or in any combination relates to the claimed compositions or to any composition to relates to killing instead of growing, the cited reference along or in any combination cannot render obvious new claims 35-59. Applicant, therefore, respectfully requests withdrawal of this section 103 rejection.

**The Commissioner is authorized to charge any additional claim fees to Deposit Account No. 501518.**

Respectfully Submitted,

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Robert W. Strozier, Reg. No. 34,024

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